

REMARKS

Claim 40 is newly added by this amendment and combines original claims 1 and 4.

Claim 41 is newly added by this amendment and combines claims 18 and 22.

Claims 1, 4, 18 and 22 are accordingly cancelled by this amendment.

Claim 31 has been amended to overcome lack of antecedent basis.

Claims 2-3, 5-6, 11, 15, 19-21, 23-24, 28-30, 33-34, and 37-39 have been amended to conform with newly added claims 40 and 41 and to correct typographical errors.

Claims 2-3, 5-17, 19-21, and 23-41 are pending and at issue in this patent application. Of these, claims 39, 40 and 41 are independent. Claims 1, 4, 18, and 22 are cancelled by this application. Applicants respectfully request reconsideration and favorable action in this case.

Applicants respectfully traverse the rejection of claims 2-3, 5-17, 19-21, and 23-41 as obvious over Naya (U.S. Patent No. 5,875,032) in view of Hoppe et al. (U.S. Patent No. 6,570,657), in light of the current amendments.

Each of claims 2-3, 5-17, 19-21, and 23-41 recites a method or a device that positions a differential position or intensity sensitive photodetector at the surface plasmon resonance intensity minimum such that the difference in intensity signal received is near zero and then detects subsequent changes in the intensity distribution due to surface plasmon resonance angular shift and amplifies the differential signal received from the photodetector to improve angular resolution.

Neither Naya nor Hoppe discloses positioning a photodetector at the surface plasmon resonance intensity minimum (resonance angle) such that the difference in intensity signal received is near zero and then detecting subsequent changes in the intensity distribution due to surface plasmon resonance angular shift. Moreover, neither Naya nor Hoppe discloses amplifying the differential signal received from the photodetector. Thus, no combination of Naya or Hoppe can render any of the pending claims obvious.

While Hoppe discloses a sample material containment cell for a surface plasmon resonance (SPR) spectroscopy device, it does not, in any manner, disclose positioning a photodetector at a plasmon intensity minimum such that the difference signal received from the detector is zero. Hoppe also does not disclose amplifying a differential signal from a photodetector.

While Naya discloses using a differential position photodetector, it does not disclose the calibration step of first positioning the photodetector at the plasmon resonance intensity minimum by zeroing the intensity differential signal of the detector and then determining the resonance angle displacement from changes in the intensity distribution. Instead, Naya discloses a fixed first and second photodetector that determines, in a single step, a resonance angle based on the differential signal from its detectors and a calibration curve.

In fact, Naya teaches away from using an adjustable detector or positioning step by distinguishing itself from "conventional surface plasmon sensors where a movable photodetector ... is used." (Naya, Col. 3, Lines 44-47). Naya is also primarily focused on reducing the number of parts for a SPR spectroscopy device, thereby teaching away from adding an adjustable photodetector component that would be extraneous to its design.

Examiner contends that Naya discloses the centering step in Figures 2A and 2B of the Naya specification. Applicants respectfully disagree. Figures 2A and 2B and the corresponding portions of the specification (Col. 2, Line 53 - Col. 3, Line 18) simply disclose that the resonance angle may fall on one of a first photodetector or a second photodetector. Moreover, the Examiner's contention that the step of positioning the resonance minimum is indistinguishable over the fixed sensor of Naya is unwarranted because the claims specifically recite how the sensor is to be positioned, i.e., positioning the sensor such that the difference signal received from the detector is near zero.

Moreover, Naya cannot render any of the pending claims obvious because Naya does not recognize the advantage of first positioning the detector on the initial resonance angle before measuring an angular displacement. This two step process enhances the accuracy of measuring the resonance angle of a sample material in two ways. First, measuring the initial reference angle can account for mechanical and thermal drift. Second, the sensitivity of the displacement measurement is enhanced because there is greater probability that the displacement angle will lie within the range of the detectors after the sample is introduced.

Naya does not, in any manner suggest or recognize this advantage. Instead, in the fixed photodetector set disclosed by Naya, the intensity and the sensitivity of the resonance angle measurement is depended on the angle at which the photodetector is fixed. Consequently, Naya limits the range of samples that can be accurately analyzed with any particular embodiment because no adjustments can be made for samples that have resonance angles falling outside the fixed range covered by the detectors.

It is clear that the prior art must make a suggestion of or provide an incentive for a claimed combination of elements to establish a prima facie case of obviousness. See, *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985). This principle holds true even if the applied art could be modified to produce the invention recited by the pending claims. See, *In re Mills*, 16 U.S.P.Q.2d 1430, 1432 (Fed. Cir. 1990); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.") Neither Naya nor Hoppe teach or even suggest the desirability of positioning the photodetector such that the differential intensity signal received is near zero in order to increase accuracy of the resonance angle measurement. Moreover, neither Naya nor Hoppe teach or suggest amplifying the differential signal to enhance resolution of the angular measurement.

Therefore, neither Naya nor Hoppe, alone or in combination, can render any of the pending claims obvious.

CONCLUSION

Applicants submit that this case is in a condition for immediate allowance. For the foregoing reasons and for other reasons clearly apparent, Applicants respectfully request reconsideration and allowance of pending claims 2-3, 5-17, 19-21, and 23-41.


Although Applicants believe that no other fees are due, the Commissioner is hereby authorized to charge any fees or to credit any overpayments to Deposit Account No. 13-2855 of Marshall, Gerstein & Borun LLP. In addition, if a petition for an extension of time under 37 CFR 1.136(a) is necessary to maintain the pendency of this case and is not otherwise requested in this case, Applicants request that the Commissioner consider this paper to be a request for an appropriate extension of time and hereby authorize the Commissioner to charge the fee as set forth in 37 CFR 1.17(a) corresponding to the needed extension of time to Deposit Account No. No. 13-2855 of Marshall, Gerstein & Borun LLP.

If there are matters that can be discussed by telephone to further the prosecution of this application, Applicants respectfully request that the Examiner call its attorney at the number listed below.

Respectfully submitted,

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April 22, 2004